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NOTES AND LITERATURE

BIOLOGY

Loeb's Dynamics of Living Matter.[1]— The point of view of Professor Loeb's new book will be surmised by those acquainted with his other writings. Living organisms are to be considered as chemical machines which differ fundamentally from any machines so far created by man in possessing the peculiarities of automatically developing, preserving, and reproducing themselves. In this volume we have an attempt to analyze the strictly biological phenomena of development, self-preservation, and reproduction from a purely physico-chemical point of view.

Inasmuch as the material and the energy of organisms must be supplied by chemical processes, it is only natural that this subject should receive the first attention. Two lectures are therefore devoted to the general chemical and physical problems involved in a study of living matter.

These two lectures are followed by three of particular interest to the physiologist. Hypotheses of muscular contraction and protoplasmic motion and the physical and chemical factors involved in cell division are treated and an entire chapter is devoted to the important subject of the *rôle* of electrolytes in the formation and preservation of living matter, and another to the effect of heat and radiant energy upon living matter.

While these chapters are especially commended to the physiologist, it does not follow that they are lacking in interest to the biologist whose work touches only incidentally upon modern physiology. But to the mind of the reviewer the first six chapters are of more interest to the physiologist while the final six will be read with the keenest interest by the general biologist as well.

In the chapter on tropisms the essential similarity of tropic responses in animals and plants is considered and in so far as possible all are referred to physico-chemical forces. This presents no great difficulty in the case of heliotropism, galvanotropism, and chemotropism, but geotropism and stereotropism are more difficult to explain. The relation of the reactions to lines of force and the reason for this relation are made clear. The discussion of the control of the degree and the sense of heliotropic response is especially interesting. The demonstration of the possibility of controlling these reactions by chemical and other means, the apparent uselessness of many of them, and the fact that many could never be used at all in Nature tend to show that they could not have been acquired by way of natural selection.

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[1] Loeb, J. *The Dynamics of Living Matter.* Columbia University Biological Series VIII. New York, The MacMillan Company, 1906. 8vo, xi +233 pp., 64 text-figs. $3.00.

The chapters on fertilization and heredity will probably be the first to be read by many biologists. Two effects of the entrance of a spermatozoön into an egg must be distinguished. The first is the starting of the process of development, the developmental effects, while the second is the transmission of the paternal qualities to the organism, the hereditary effect. Under the first of these heads are considered the specific character of the fertilizing power of the spermatozoön, and its modification by chemical means — so that forms otherwise incapable of crossings may be hybridized — and the principles and results of experiments in artificial parthenogenesis. While the development of the egg may be caused without the presence of a sperm nucleus or an enucleated fragment of egg protoplasm may be caused to develop by fertilization by a spermatozoön, we must recognize the hereditary effect of egg or sperm nucleus as a distinct phenomenon. The structure of the gametes is exceedingly simple and yet instincts as well as bodily form are transmitted through the sexual cells. Obviously purely morphological conceptions cannot carry us very far here and we first think of definite chemical compounds as the bearers of hereditary qualities. The evidence afforded by experiments upon the toxic effect of the blood of a different species seems significant in this connection but our real knowledge of these phenomena is very meager and it seems impossible to draw any far-reaching inferences.

The minute size of the gametes precludes any extensive analyses of the physico-chemical processes concerned in the formation of organs, but the conditions of morphogenesis may be studied in regenerative processes. Loeb follows Sachs in the view that the variety in the form of organs is determined by a corresponding variety in their chemical constitution and advances arguments from heteromorphosis in various forms. The influence of the central nervous system is discussed and the possibility of the conduction of definite chemical substances to or from the ganglia is suggested.

It is hardly necessary to state that in so far as views on evolution are expressed they are essentially de Vriesian and with the acceptance of the validity of de Vries's conclusions concerning discontinuity, there is the suggestion of the physico-chemical nature of discontinuity in evolutionary transformations.

The Columbia University Biological Series is so familiar to naturalists that comment upon the attractiveness of the volume is quite superfluous and we may simply say that the general scientific public is to be congratulated on having in a condensed form the point of view and chief results of the school of biologists of which Professor Loeb is our best known advocate.

J. A. Harris

ZOÖLOGY

Capture of the Salamander, Autodax lugubris, at Los Angeles, Cal. — One of the points of interest concerning the genus Autodax is its extremely limited range. The taking of a specimen of *A. lugubris* in Los Angeles, Cal., a locality at a considerable distance from what has heretofore been considered the center of its distribution, seems of sufficient importance, therefore, to justify this note on the subject.

In a previous paper on the species by Professor Ritter and myself (*Amer. Nat.*, vol. 33, pp. 691–704, 1899), mention is made of the distribution of the genus as follows: "Autodax is a genus of salamanders confined, according to our present knowledge, to western North America and almost entirely to California." Cope (*U. S. Nat. Mus., bull.* 34) states that "no species has yet been found east of the Pacific coast region." He describes the three species of the genus from specimens in the U. S. National Museum which are distributed as follows:—

16	specimens,	Petaluma, Cal.	Lat. 38° 15′ N.
5	"	Farallone Is.	37° 40′ "
10	"	San Francisco	37° 40′ "
4	"	Berkeley	37° 40′ "
7	"	Monterey	36° 45′ "
1	"	Fort Tejon	35° 0′ "
		Range	3° 15′